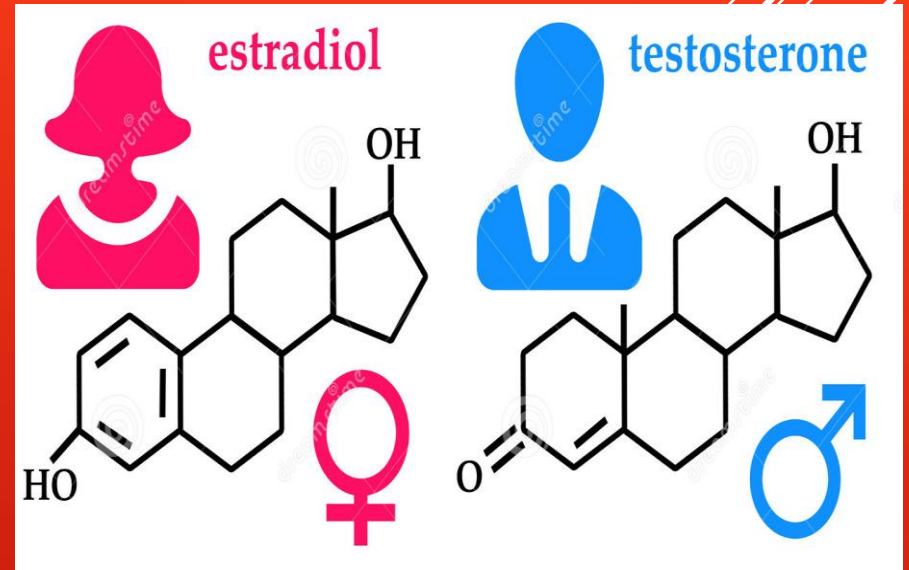


ENDOCRINE SYSTEM

Mr. Erick Santizo





KEEP
CALM
AND
CONTROL YOUR
HORMONES



To control your hormones is to
control your life.

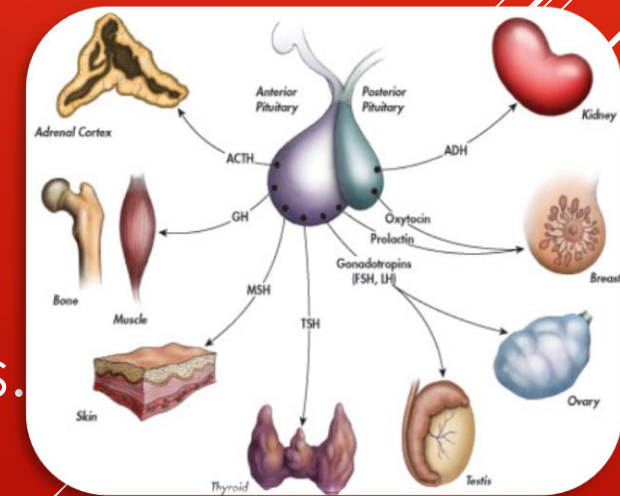
Barry Sears

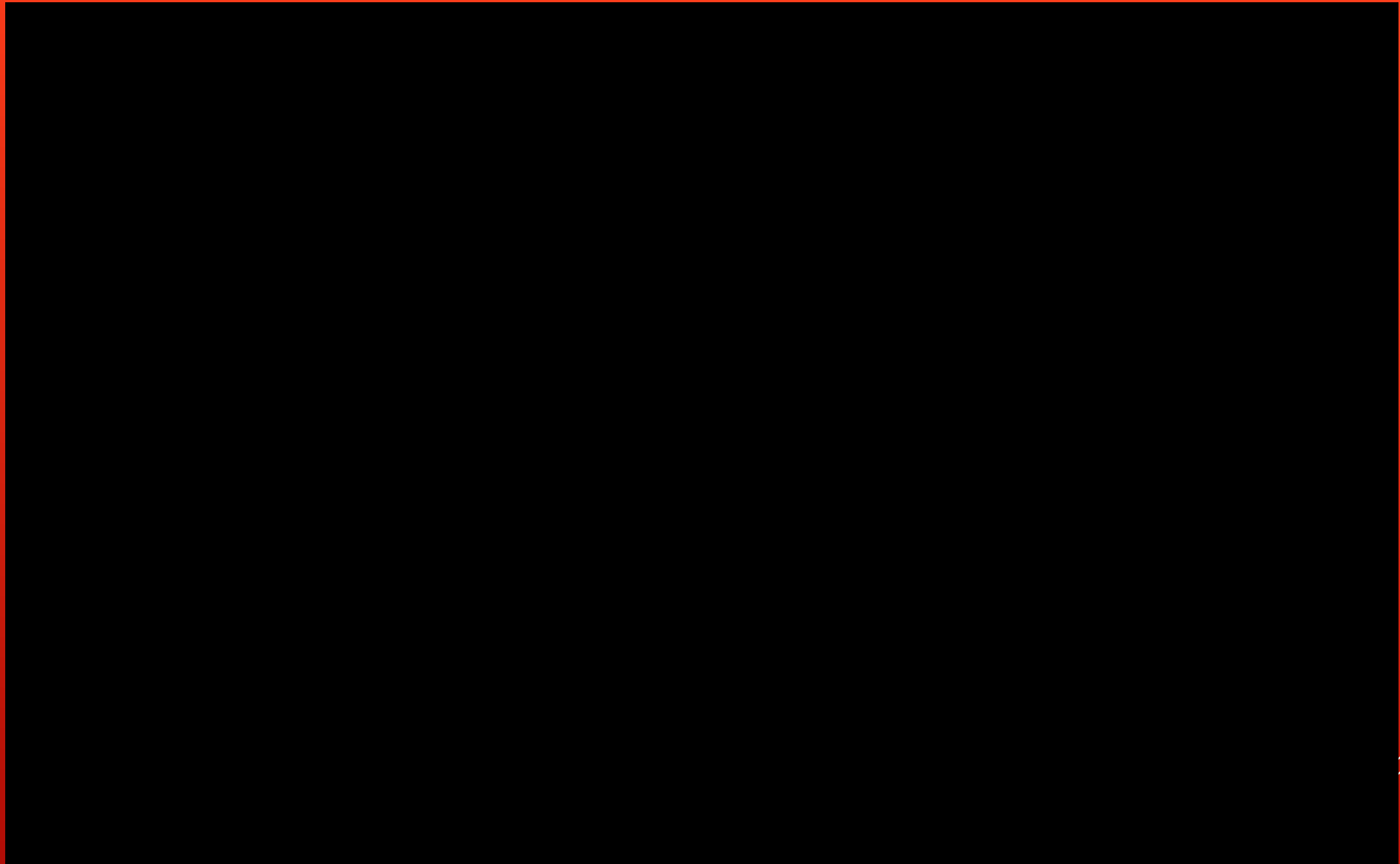
DO HORMONES ONLY
DEAL WITH SEX?

- ▶ -**Hormones**: are chemical substances which are produced by animals and plants to regulate the organism's activities.
- ▶ They are produced in ductless glands called **endocrine glands**.
- ▶ - Called ductless because they have no tubes nor glands to carry the hormones to the blood.
- ▶ - The tissue on which a particular hormone or group of hormones acts is called a **target tissue**.
- ▶ It affects a target tissue more slowly than a nerve impulse affects a muscle. (slower and more long term) except for **adrenalin**.

▶ Role of hormones:

- ▶ - they help to control the internal environment
- ▶ - they allow us to respond to emergencies and danger.
- ▶ - they are involved in growth and development processes.
- ▶ - they are involved in reproduction.





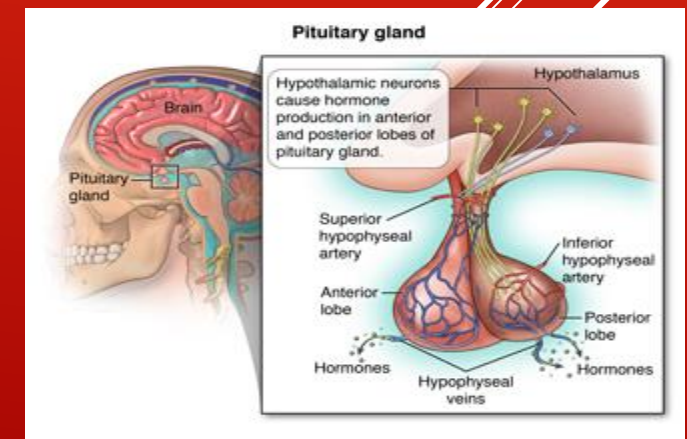
HOW DOES THE ENDOCRINE SYSTEM WORK?

- ▶ A. _____: Produces testosterone which helps to develop and maintain secondary sexual characteristics
- ▶ B. _____: Connected to the hypothalamus at the base of the brain. Produces nine different hormones which affect: water reabsorption from kidney tubules, growth, sperm and egg production and release of hormones by other endocrine glands.
- ▶ C. _____: islets of Langerhans- groups of cells which produce insulin and glucagon. These hormones help to regulate glucose levels in the blood.

- ▶ D. _____: produces thyroxin which affects the rate of metabolism.
- ▶ E. _____: produces estrogen and progesterone which regulate the menstrual cycle and help to develop and maintain secondary sexual characteristics.
- ▶ F. _____: produces adrenalin which increases heart beat and the rate of breathing. It also stimulates the release of glucose from the liver. More glucose more oxygen in the muscles both necessary for energy in rapid contractions. (fight or flight hormone).

- ▶ Follicle stimulating hormone (FSH) stimulates egg growth and estrogen secretion in females and sperm production in males.
- ▶ Luteinising hormone (LH) stimulates egg release (ovulation) in females and testosterone production in males.
- ▶ Anti-diuretic hormone (ADH) controls water content of the blood
- ▶ Growth hormone (GH) Speeds up the rate of growth and development in children.

PITUITARY GLAND



▶ Pancreas

- ▶ Insulin: lowers blood glucose
- ▶ Glucagon: raises blood glucose

▶ Progesterone: regulates menstrual cycle

▶ Oestrogen: controls female secondary characteristics and regulates menstrual cycle.

OTHER HORMONES



Characteristic	Endocrine system	Nervous system
Transmission of information		
Route of transmission		
Speed at which information is transmitted		
Effects		
Responses		

LET US COMPARE THE NERVOUS SYSTEM AND THE ENDOCRINE SYSTEM

Characteristic	Endocrine system	Nervous system
Transmission of information	Chemical	Electrical (nerve) impulses
Route of transmission	Circulatory system in blood	Neurones
Speed at which information is transmitted	Usually slow (although adrenalin is immediate)	Immediate, rapid
Effects	Long-lasting	Short-lived
Responses	Affects whole body, but may be centred on particular organ	Affects particular organs, may involve reflexes.

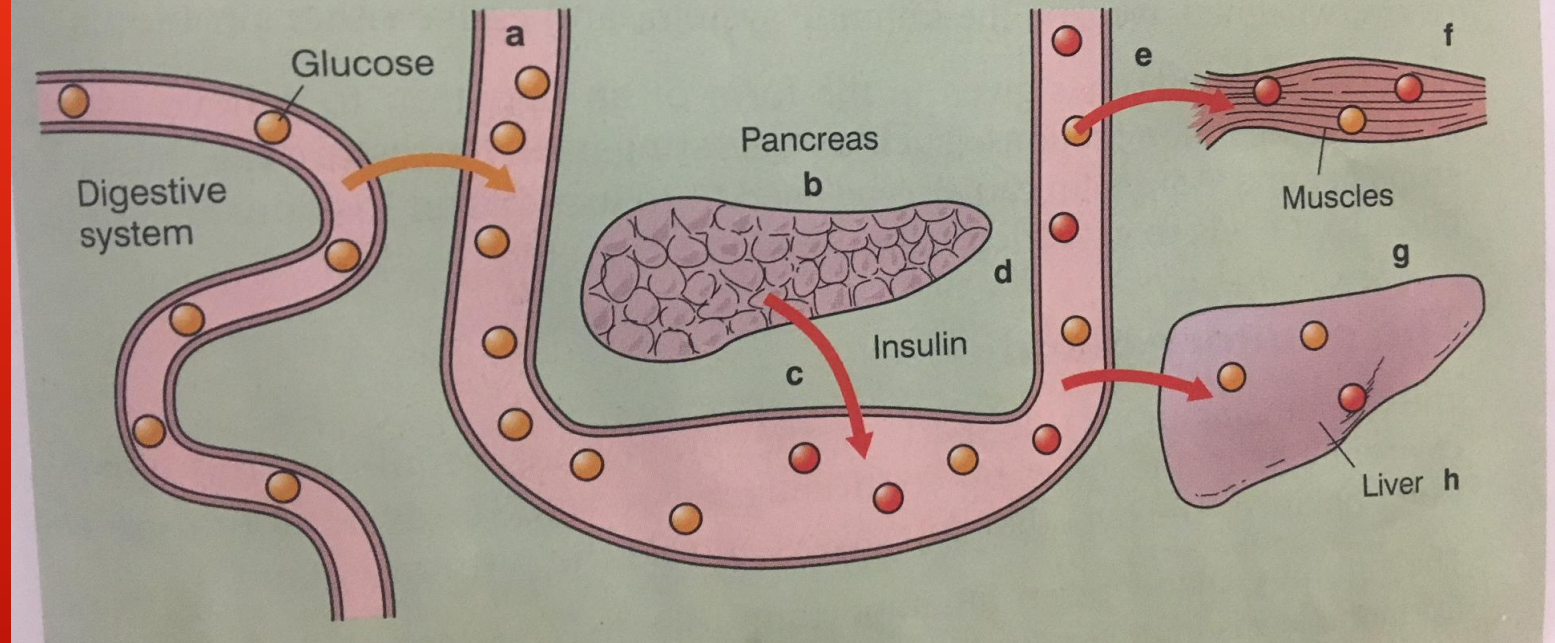
- ▶ An increase in blood glucose levels and a higher metabolic rate.
- ▶ An increase in the breathing rate so that muscles get more oxygen.
- ▶ Dilation of blood vessels to muscles so they get more oxygen and food and tire less easily.
- ▶ An increase in the heart rate so that more blood is pumped through the body.
- ▶ Inhibition of digestion and excretion so that energy needed to respond to stress is not wasted elsewhere.

ADRENALINE



Questions

- 1 Study the diagram in Figure 18.4 showing how insulin works in the body. Write labels to describe what is happening at steps **a** to **h**.



THE PANCREAS: INSULIN AND GLUCAGON

